NEC

SILICON TRANSISTOR ARRAY

μPA1453

PNP SILICON POWER TRANSISTOR ARRAY
HIGH SPEED SWITCHING USE
INDUSTRIAL USE

DESCRIPTION

The μPA1453 is PNP silicon epitaxial 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}. Low $V_{CE(sat)}$.
  h_{FE} = 100 to 400 (at I_C = –2 A)
  $V_{CE(sat)}$ = –0.3 V MAX. (at I_C = –2 A)

ORDERING INFORMATION

Part Number	Package	Quality Grade
μPA1453H	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 ˚C)

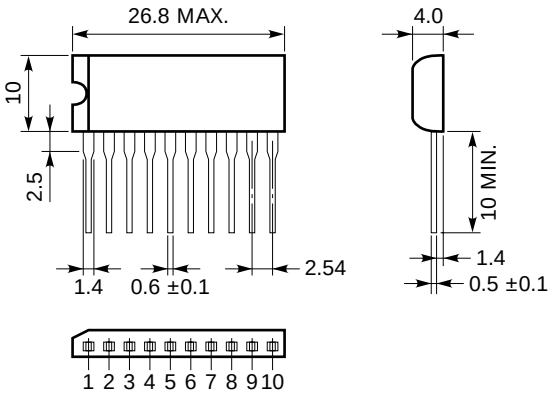
Collector to Base Voltage	V_{CBO}	–60	V
Collector to Emitter Voltage	V_{CEO}	–60	V
Emitter to Base Voltage	V_{EBO}	–7	V
Collector Current (DC)	$I_{C(DC)}$	–5	A/unit
Collector Current (pulse)	$I_{C(pulse)}$*	–10	A/unit
Base Current (DC)	$I_{B(DC)}$	–1.0	A/unit
Total Power Dissipation	P_{T1}**	3.5	W
Total Power Dissipation	P_{T2}***	28	W
Junction Temperature	T_j	150	˚C
Storage Temperature	T_{stg}	–55 to +150	˚C

* PW ≤ 300 μs, Duty Cycle ≤ 10 %

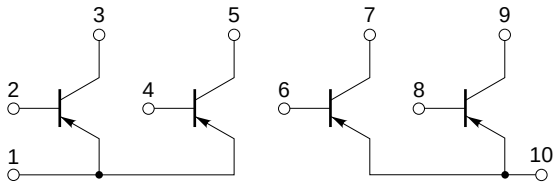
** 4 Circuits, T_a = 25 ˚C

*** 4 Circuits, T_c = 25 ˚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)

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

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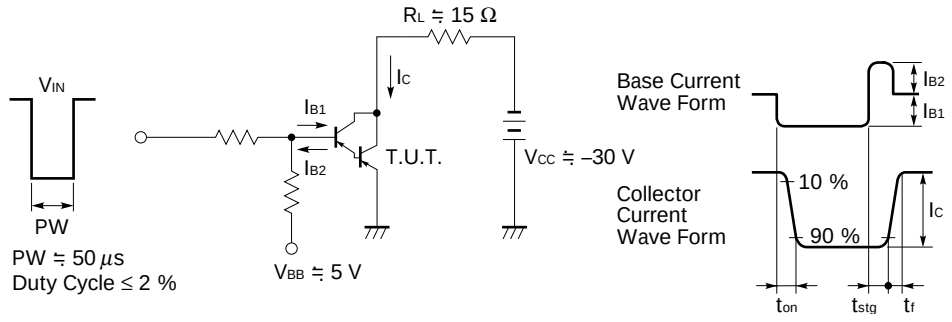
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Leakage Current	I_{CBO}			–10	μA	V_{CB} = –50 V, I_E = 0
Emitter Leakage Current	I_{EBO}			–10	μA	V_{EB} = –5 V, I_C = 0
DC Current Gain	h_{FE1} *	60	220		—	V_{CE} = –1 V, I_C = –0.1 A
DC Current Gain	h_{FE2} *	100	220	400	—	V_{CE} = –1 V, I_C = –2 A
DC Current Gain	h_{FE3} *	50	100			V_{CE} = –2 V, I_C = –5 A
Collector Saturation Voltage	$V_{CE(sat)}$ *		–0.2	–0.3	V	I_C = –2 A, I_B = –0.2 A
Base Saturation Voltage	$V_{BE(sat)}$ *		–0.9	–1.2	V	I_C = –2 A, I_B = –0.2 A
Turn On Time	t_{on}			1	μs	I_C = –2 A I_{B1} = –I_{B2} = –0.2 A V_{CC} ≒ –30 V, R_L ≒ 15 Ω See test circuit
Storage Time	t_{stg}			2.5	μs	
Fall Time	t_f			1	μs	

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

SWITCHING TIME TEST CIRCUIT



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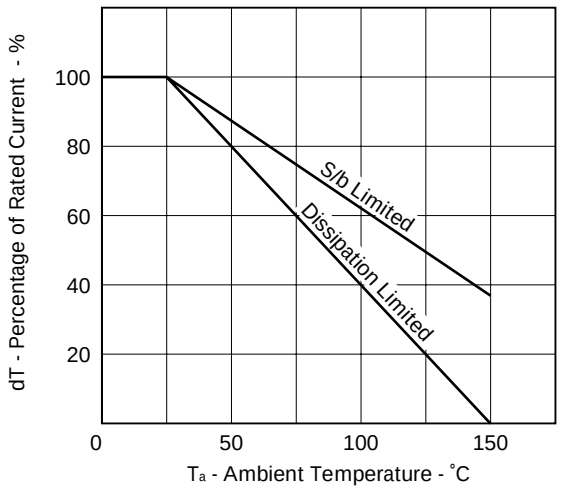
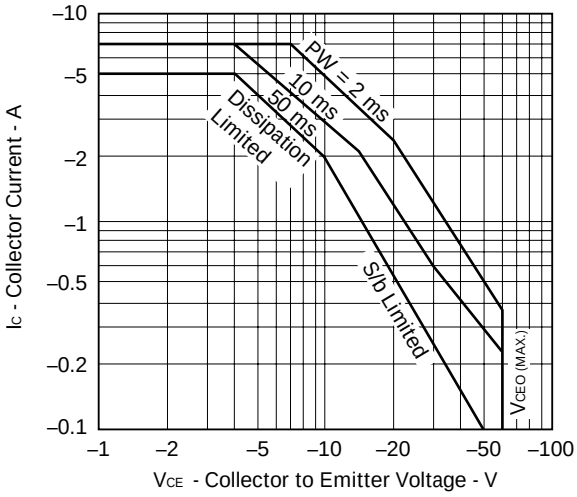
TYPICAL CHARACTERISTICS (T_a = 25 ˚C)

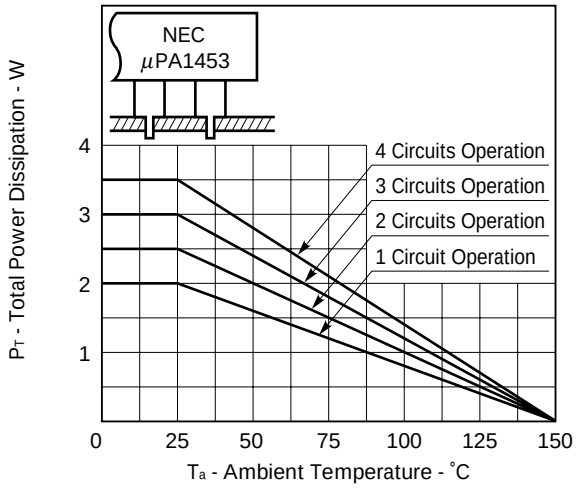
DERATING CURVE OF SAFE OPERATING AREA



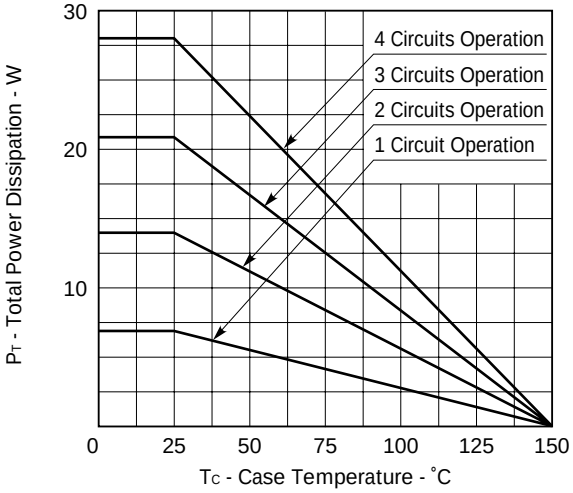
SAFE OPERATING AREA



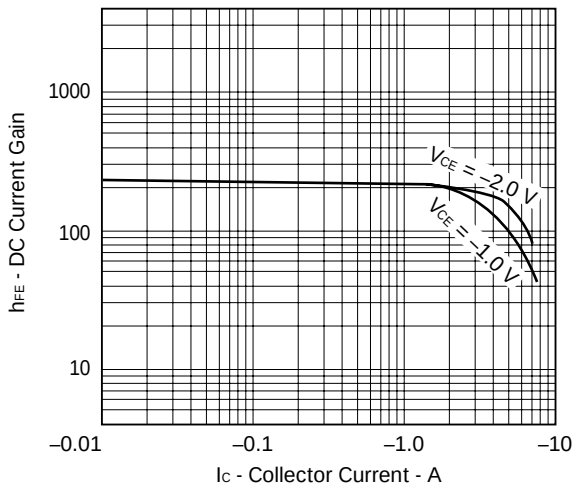
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



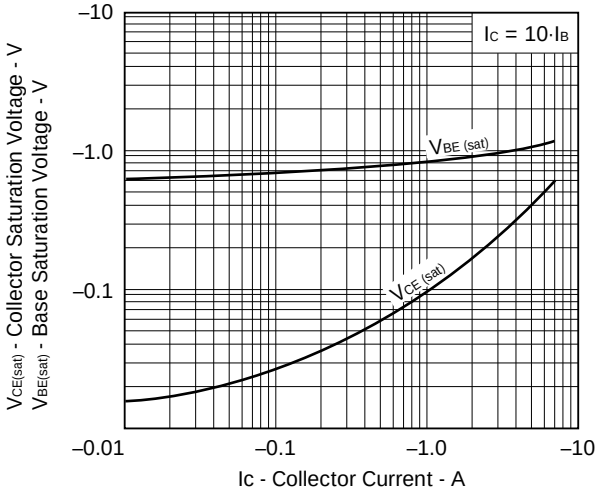
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



DC CURRENT GAIN vs. COLLECTOR CURRENT



COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



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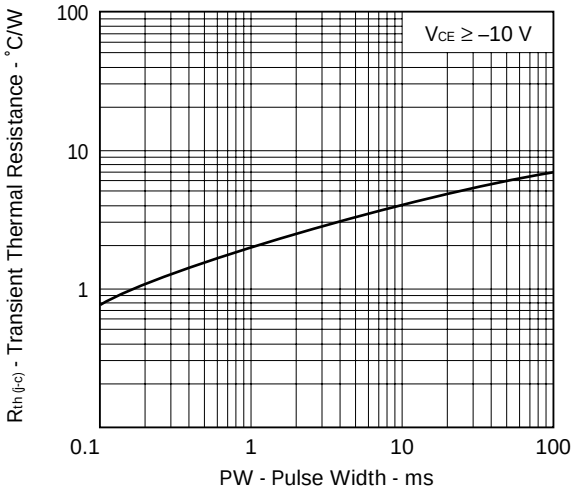
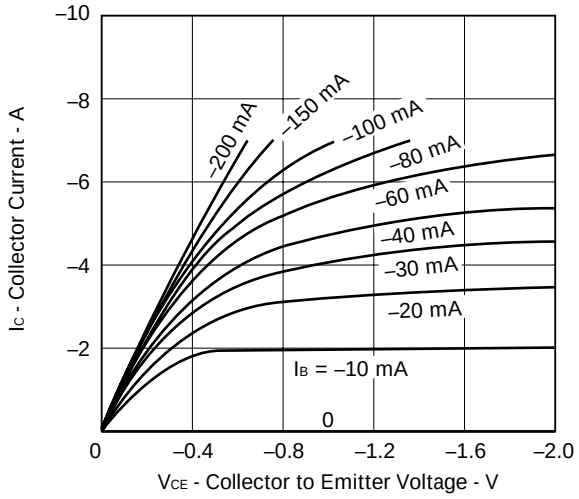
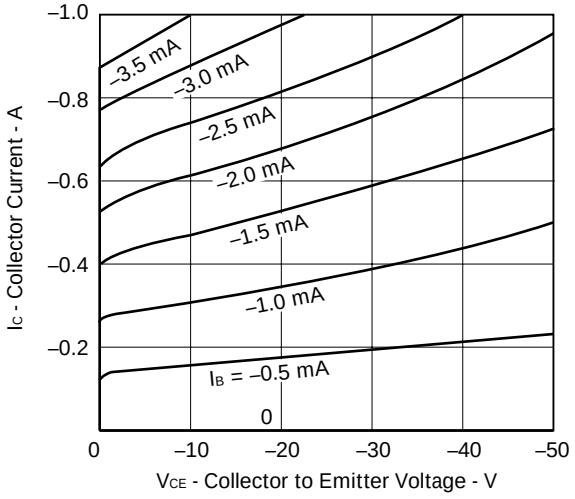
TRANSIENT THERMAL RESISTANCE



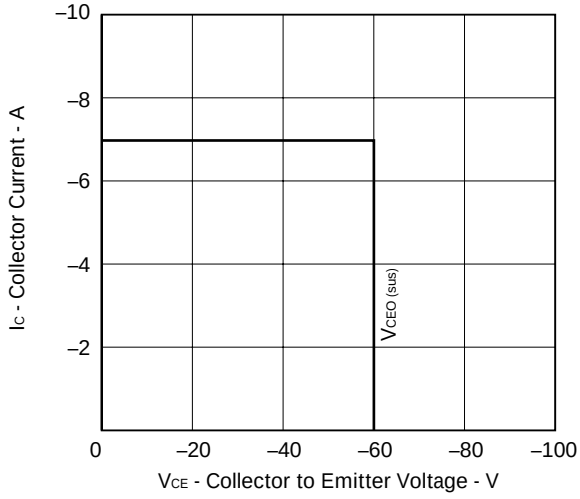
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



REVERSE BIAS SAFE OPERATING AREA



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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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