NEC

SILICON TRANSISTOR ARRAY

Phase-out/Discontinued

μPA1424

NPN SILICON POWER TRANSISTOR ARRAY
MEDIUM SWITCHING USE

DESCRIPTION

The μPA1424 is NPN silicon epitaxial Power Transistor Array that built in resistance and 4 circuits designed for driving solenoid, relay, lamp and so on.

FEATURES

- Easy mount by 0.1 inch of terminal interval.
- Zener Diode built in, for Surge Absorbing.
- Bias Resistance built in.
  R_1 = 680 Ω, R_2 = 10 kΩ
- Low Power loss when driving actuator.
  V_{OL} ≦ 0.4 V @ V_{in} = 4.2 V, I_C = 0.8 A
  V_{OL} ≦ 0.5 V @ V_{in} = 4.2 V, I_C = 1.0 A

ORDERING INFORMATION

Part Number	Package	Quality Grade
μPA1424H	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.

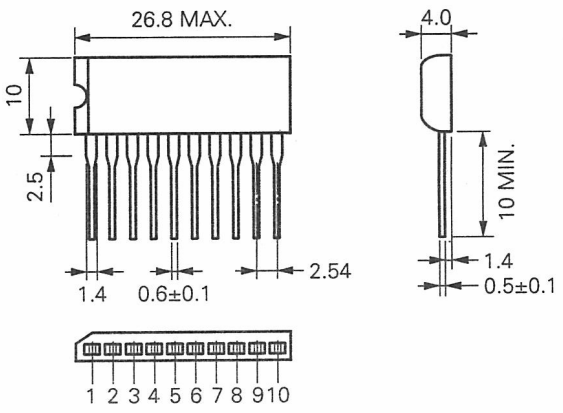
ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Collector to Base Voltage	V_{CBO}	60±10	V
Collector to Emitter Voltage	V_{CEO}	60±10	V
Emitter to Base Voltage	V_{EBO}	15	V
Collector Current (DC)	$I_{C(DC)}$	±2	A/unit
Collector Current (pulse)	$I_{C(pulse)}$*	±3	A/unit
Base Current (DC)	$I_{B(DC)}$	0.03	A/unit
Total Power Dissipation (T_a = 25 °C)	P_{T1}**	3.5	W
Total Power Dissipation (T_C = 25 °C)	P_{T2}**	28	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	−55 to +150	°C

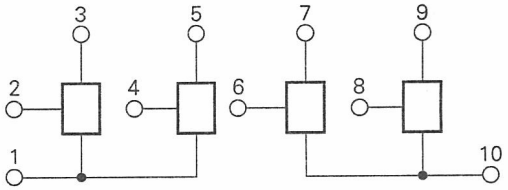
* PW ≦ 10 ms, Duty Cycle ≦ 50 %

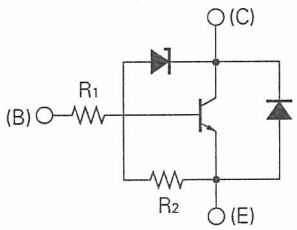
** 4 Circuits

PACKAGE DIMENSIONS
(in millimeters)



CONNECTION DIAGRAM





PIN No.

2, 4, 6, 8	Base (B)
3, 5, 7, 9	Collector (C)
1, 10	Emitter (E)

R_1 ≒ 680 Ω
R_2 ≒ 10 kΩ

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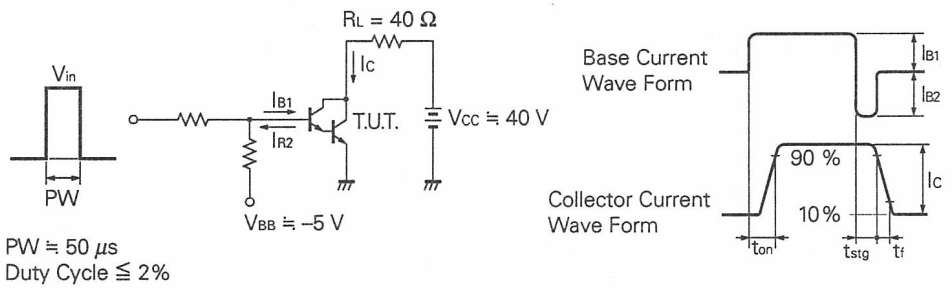
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector to Emitter Voltage	$V_{CEO(sus)}$	50	60		V	I_C = 2 A, I_B = 5 mA, L = 6 mH
Collector Leakage Current	I_{CBO}			100	nA	V_{CB} = 40 V, I_E = 0
DC Current Gain	h_{FE1}*	700	1 200		–	V_{CE} = 5 V, I_C = 0.2 A
DC Current Gain	h_{FE2}*	1 000	1 700	3 000	–	V_{CE} = 5 V, I_C = 1 A
DC Current Gain	h_{FE3}*	500	1 300		–	V_{CE} = 5 V, I_C = 2 A
Low-Level Output Voltage	V_{OL1}*			0.4	V	V_{in} = 4.2 V, I_C = 0.8 A
Low-Level Output Voltage	V_{OL2}*			0.5	V	V_{in} = 4.2 V, I_C = 1 A
Low-Level Input Voltage	V_{IL}*	400			mV	V_{CE} = 12 V, I_C = 0.1 mA
Input Resistance 1	R_1	476	680	884	Ω	
Input Resistance 2	R_2	7	10	13	kΩ	
Turn On Time	t_{on}		0.4		μs	I_C = 1 A, see Fig. 1 I_{B1} = –I_{B2} = 10 mA V_{CC} ≒ 20 V, R_L = 20 Ω
Storage Time	t_{stg}		1.4		μs	
Fall Time	t_f		0.5		μs	

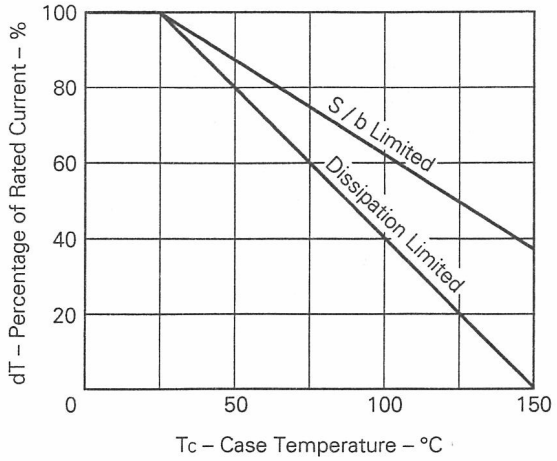
* Pulsed : PW ≦ 350 μs, Duty Cycle ≦ 2 %

Fig. 1. SWITCHING TIME TEST CIRCUIT

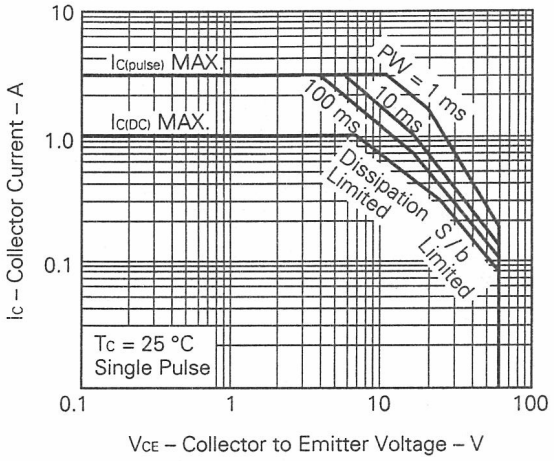


TYPICAL CHARACTERISTICS (T_a = 25 °C)

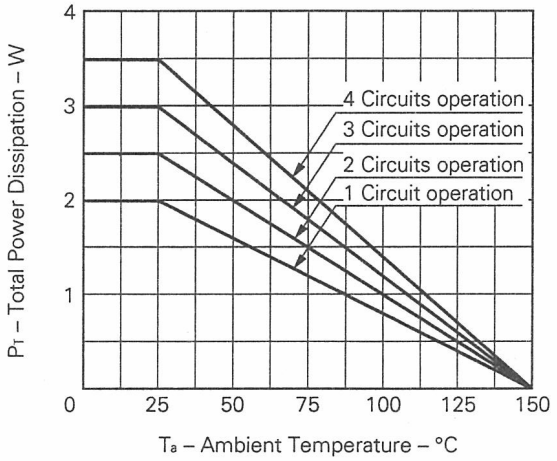
DERATING CURVE OF SAFE OPERATING AREA



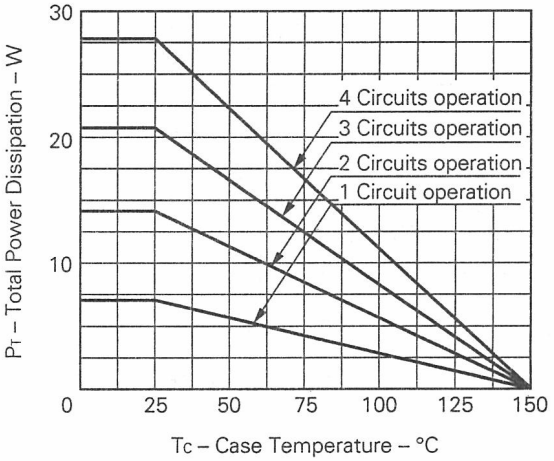
SAFE OPERATING AREA



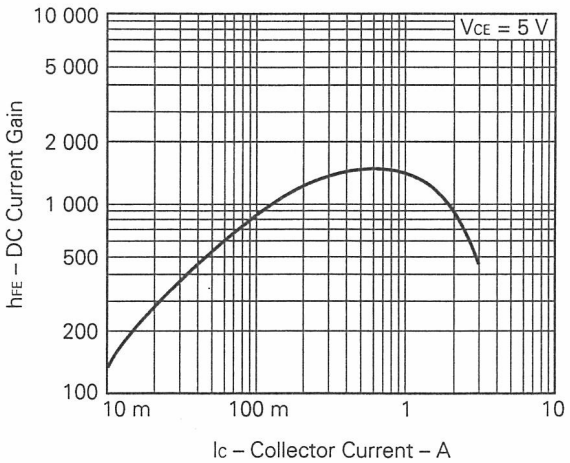
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



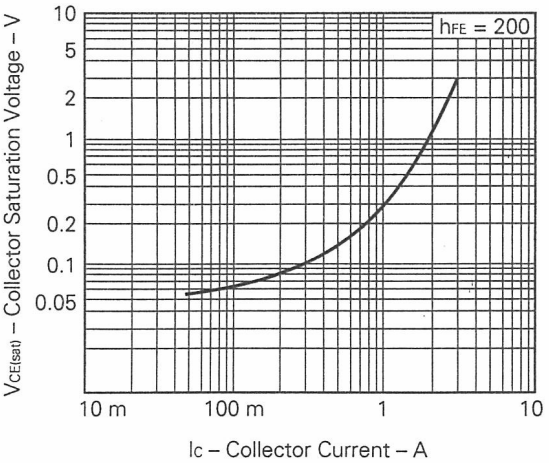
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



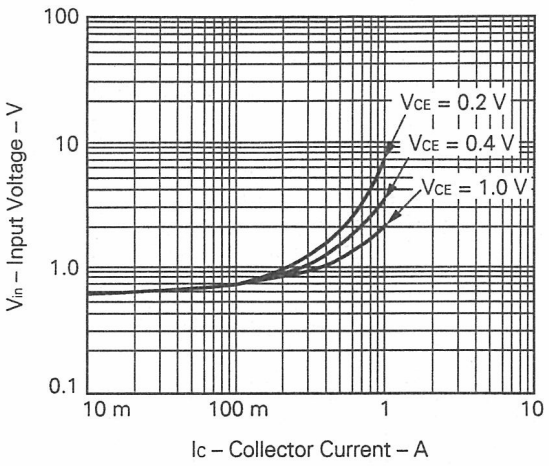
DC CURRENT GAIN vs. COLLECTOR CURRENT



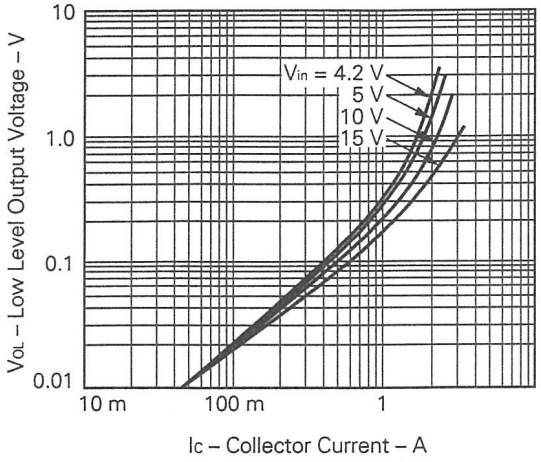
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



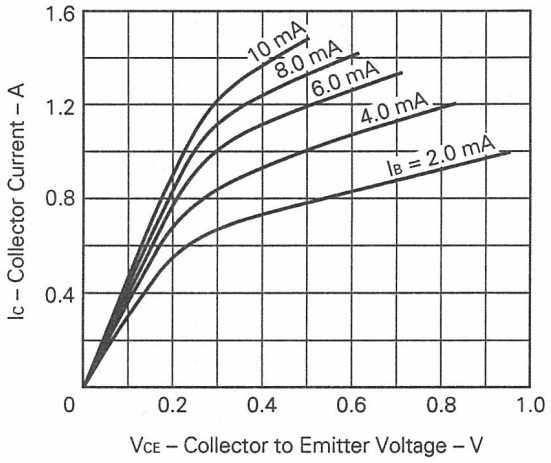
INPUT VOLTAGE vs. COLLECTOR CURRENT



LOW LEVEL OUTPUT VOLTAGE vs. COLLECTOR CURRENT



COLLECTOR CURRENT vs. COLLECTOR 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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