

Phase-out/Discontinued

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

DESCRIPTION

The μPA1438 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
μPA1438H	10 Pin SIP	Standard

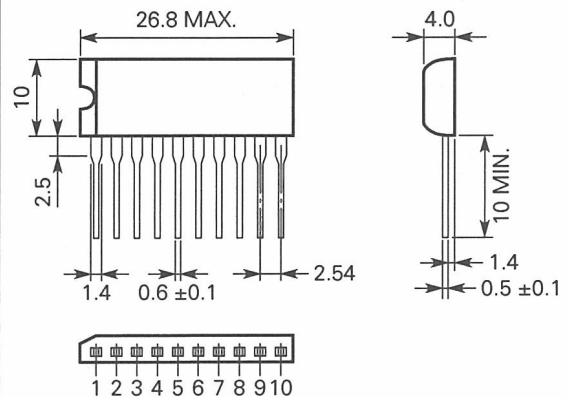
Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

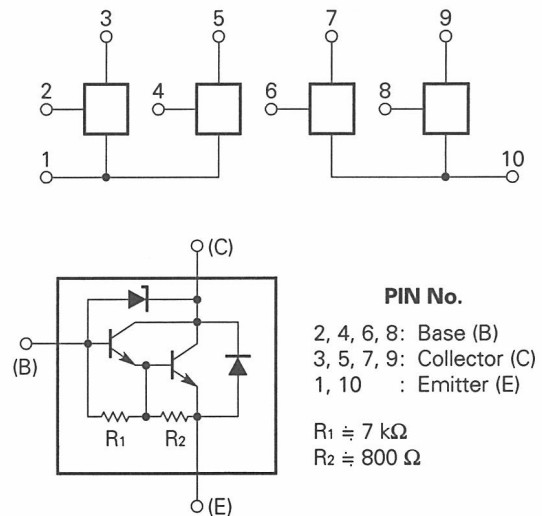
Collector to Base Voltage	V _{CB0}	60 ±10	V
Collector to Emitter Voltage	V _{CE0}	60 ±10	V
Emitter to Base Voltage	V _{EBO}	7	V
Collector Current (DC)	I _{C(DC)}	±3	A/unit
Collector Current (pulse)	I _{C(pulse)*}	±6	A/unit
Base Current (DC)	I _{B(DC)}	0.3	A/unit
Total Power Dissipation	P _{T1**}	3.5	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



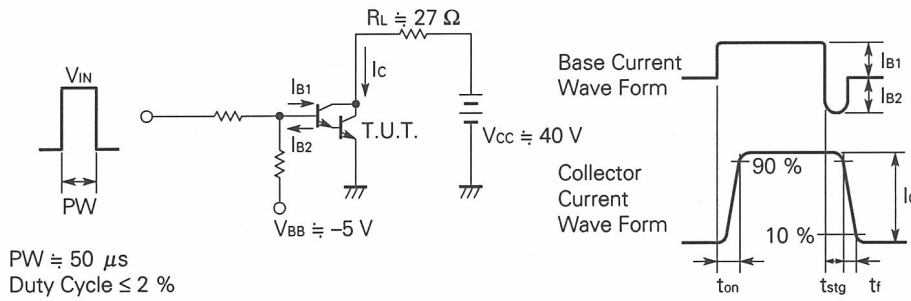
The information in this document is subject to change without notice.

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Leakage Current	I _{CB0}			10	μA	V _{CB} = 40 V, I _E = 0
Emitter Leakage Current	I _{EB0}			1	mA	V _{EB} = 5 V, I _C = 0
Collector to Emitter Sustaining Voltage	V _{CE0(SUS)}	50	60	70	V	I _C = 1.5 A, I _B = 1.5 mA, L = 1 mH
DC Current Gain	h _{FE1} *	1000			—	V _{CE} = 2 V, I _C = 0.5 A
DC Current Gain	h _{FE2} *	2000		20000	—	V _{CE} = 2 V, I _C = 1.5 A
Collector Saturation Voltage	V _{CE(sat)} *		0.9	1.2	V	I _C = 1.5 A, I _B = 1.5 mA
Base Saturation Voltage	V _{BE(sat)} *		1.5	2	V	I _C = 1.5 A, I _B = 1.5 mA
Turn On Time	t _{on}		1		μs	I _C = 1.5 A
Storage Time	t _{stg}		3		μs	I _{B1} = -I _{B2} = 1.5 mA V _{CC} ≐ 40 V, R _L ≐ 27 Ω
Fall Time	t _f		1		μs	See test circuit

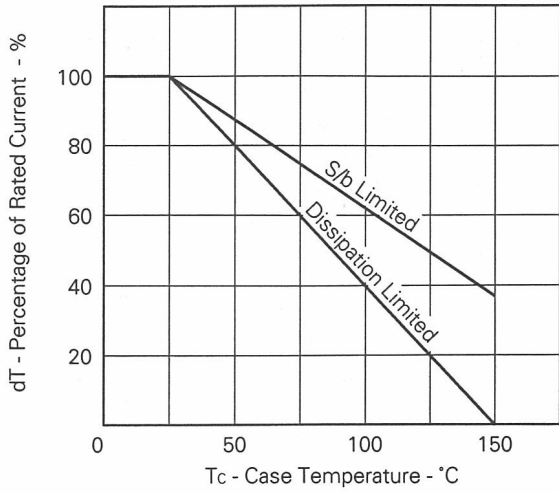
* PW ≤ 350 μs, Duty Cycle ≤ 2 % / pulsed

SWITCHING TIME TEST CIRCUIT

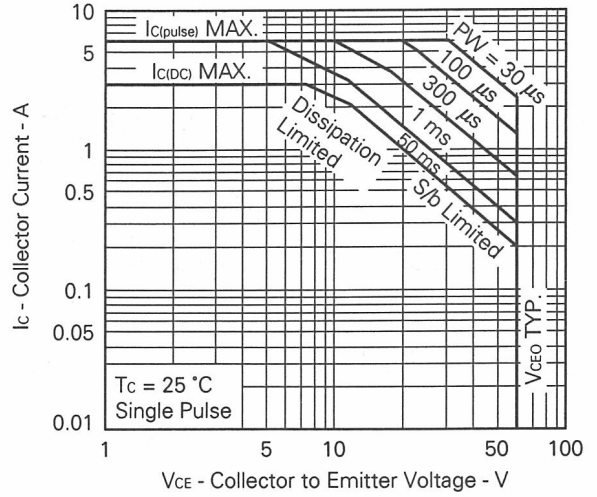


TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

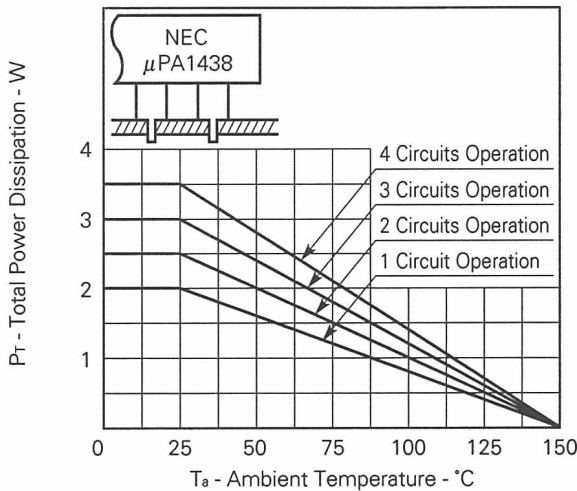
DERATING CURVE OF SAFE OPERATING AREA



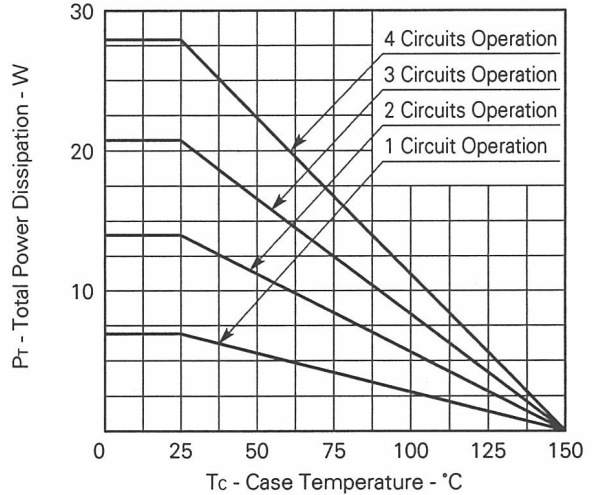
SAFE OPERATING AREA



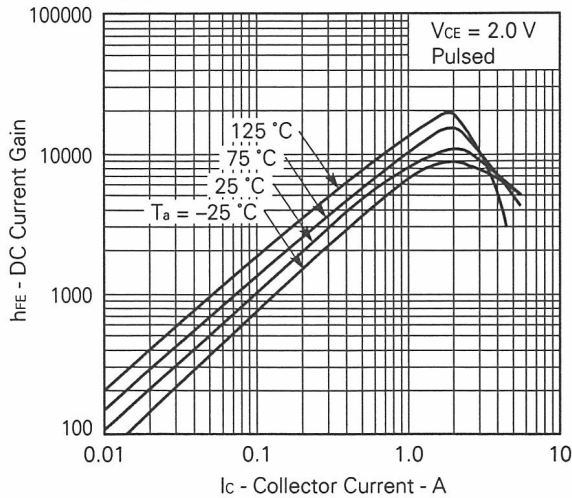
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



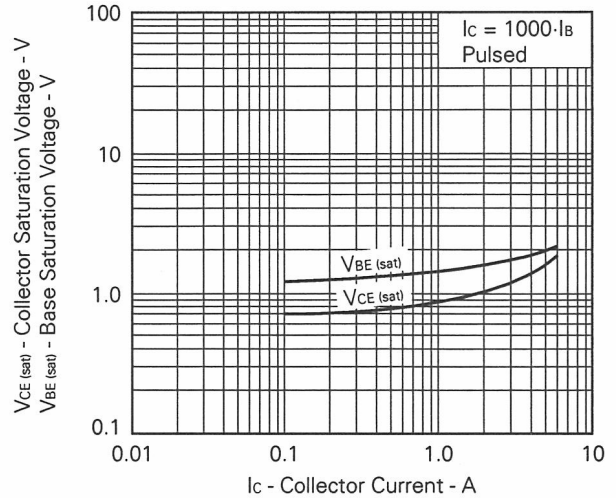
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE

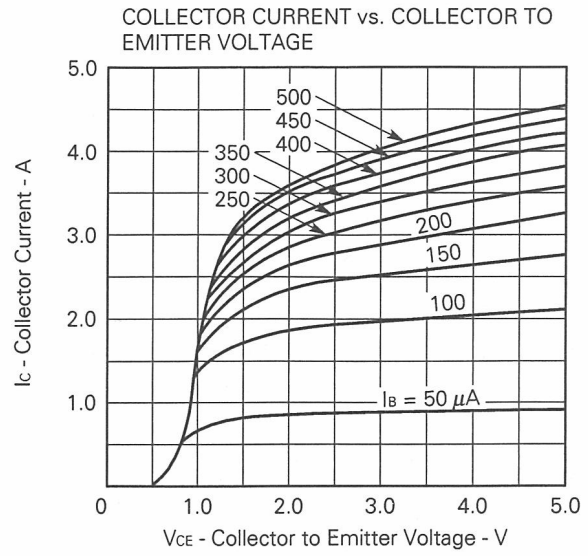
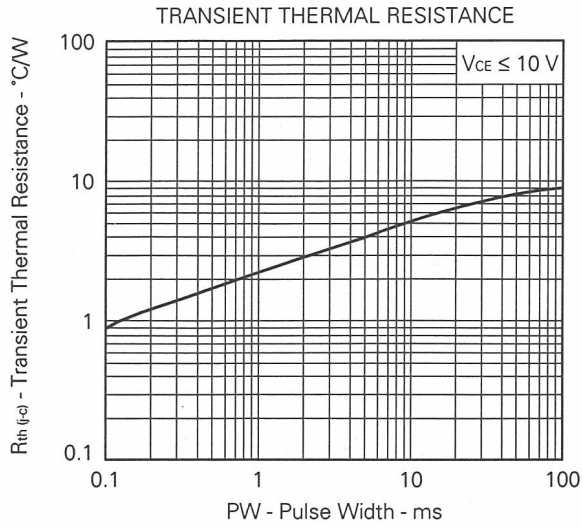


DC CURRENT GAIN vs. COLLECTOR CURRENT



BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT





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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